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ABSTRACT

This course outline in printing and preparing graphics represents an accumulation of materials and information based on the experiences of the author in the field for the past 18 years. The document opens with an orientation section which outlines class organization, reviews shop facilities, and states objectives for the course and the students. This is followed by a general description of the course: (1) class organization; (2) introduction including the evolution of printing and the elements of layout and design; (3) demonstration of an eight-page booklet dummy; (4) elements of composition; (5) elements of camera; (6) elements of plate making; and (7) elements of offset printing. The remainder of the document is a lesson plan for an Introduction to the Offset Duplicator, in which the author outlines the course objectives, a plan of order, gives examples of correct and incorrect graphic techniques, provides examples of job sheets for the instructor, assignment sheets, instructor's guide sheet, a job check chart, job analysis sheet, and three course handouts: (1) a diagram of the printing unit of the 1250 multilith, (2) offset principles of printing, and (3) a diagram of the water unit of the 1250 multilith. Suggested test vocabularies are also included. (BP)

ED 099557

CE

A COURSE OF STUDY IN PRINTING & PREPARING GRAPHICS

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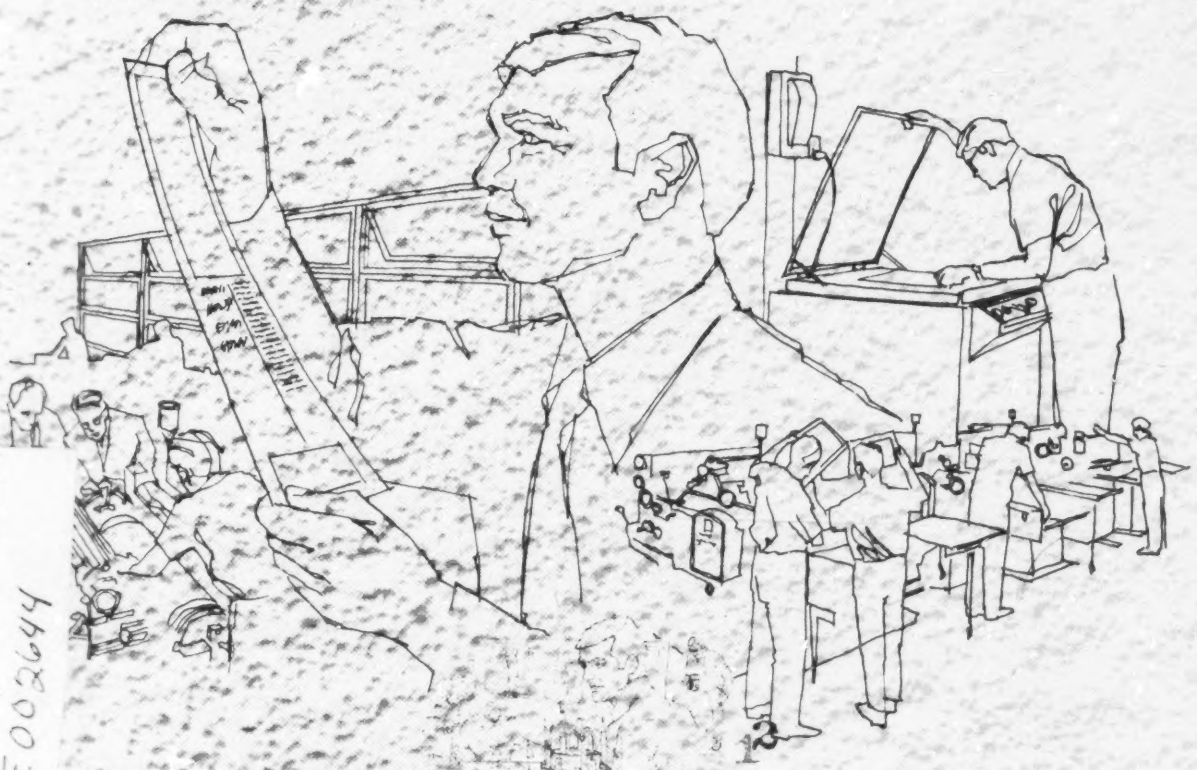

J.B. MOSCA

CE002644

Submitted By:
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Submitted To:
PROFESSOR J. WALSH
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CURRICULUM CONSTRUCTION
IN COOPERATIVE INDUSTRIAL
EDUCATION

THIS BOOKLET IS AN ACCUMULATION OF:
MATERIALS, INFORMATION, AND EXPERIENCES
IN THE FIELD OF GRAPHICS
WHICH THE AUTHOR HAS BEEN EMPLOYED FOR THE PAST 18 YEARS
AND IS NOW THE DIRECTOR OF GRAPHICS
FOR THE GRAND UNION DIVERSIFIED COMPANIES.

ORIENTATION

A-) ORGANIZATION OF CLASS:

1.) Responsibilities of the student.
   a-) Clean up and inventory of materials.

2.) Determination of grades.

3. How students will be separated into groups.
   a-) Rotation plan, so all students have time on all equipment.

4.) Fill out forms to determine various graphic arts backgrounds of students.

B-) REVIEW OF SHOP FACILITIES:

1.) Where class will meet.

2.) Camera area.

3.) Lay-out area.

4.) Plate making.

5.) Printing area.

6.) Binding and cutting.

C-) COURSE OBJECTIVES:

1.) Elements of layout and design.

2.) Elements of composition.

3.) Methods of composition.

4.) Elements of camera. (Line - Halftone)

5.) Elements of plate making.

6.) Elements of offset printing.

7.) Elements of finishing and binding.

D-) STUDENTS OBJECTIVES:

1.) To produce a 4½" x 5½", 8 page booklet with selfcover. Utilizing one 8½" x 11 sheet of paper, work and turn.

2.) Subject matter to be OK'd by instructor.

3.) Each of the following steps to be OK'd by instructor.

a.) Lay-out.

b.) Composition.

c.) Negatives and plates.

d.) Make - ready sheets.

e.) Binding.

f.) Finished product.

STUDENT QUESTIONNAIRE

Students Name:_____ Date:_____

Teacher: Yes_____, No_____ If teacher what subjects:_____

_____

If industry, what is your job and position:_____

_____

How long have you worked at this position?_____

Do you play any part in the Graphic Arts, if so what?_____

_____

_____

Are you taking this course for any of the following:

Just need 3 credits in I.A. ___

I like Graphic Arts ___

I want to teach Graphics ___

I want to get a job in G.A. ___

Want to find out about G.A.___

None of the above. Explain:_____

What do you expect to achieve from this course?_____

_____

_____

Have you ever had any previous courses in the Graphic Arts, if yes please list:_____

_____

Do you feel that Graphic Arts play an important part in every day life? Yes___, No___. Please give reason for your answer:_____

A.) CLASS ORGANIZATION:

1.) Each student or (team of students), is responsible for the cleaning and storage of any equipment used. Note: This also includes tools, table tops, or any other facilities utilized during the class period.

2.) At the first meeting in the shop area, there will be an inventory taken of all tools and small equipment.

3.) Individuals will be assigned to areas of responsibility.

4.) Multiple choice tests will be given on each given area: Lay-out, Camera, Plate making, Printing, Binding, and Finishing.

5.) Individual project will take place of exam. Lab sheets will accompany final product.

6.) A lecture and discussion period will be provided for each work area.

B.) INTRODUCTION:

1.) THE EVOLUTION OF PRINTING

It was approximately 30,000 years ago when man first attempted to record his life visually. Or what we call Graphically today. Yes those drawings on the walls of caves led us to a multimillion dollar business.

We cannot put a date on when man began to write, but we know of records written back about 5,000 years. In 600 B.C. the ancient Greeks adopted an alphabet which spread to the Mediterranean Coast.

From the 6th to the 12th century all books had to be hand lettered by men called Scribes. Before this most writing was done in monasteries. It took years to complete one book. A means of production was for one individual would sit in the middle of a room and read out loud the context of a master copy of the Bible while Scribes copied word for word what he read. This was mass production of 1423, to produce 20 books per year.

In 1440 Johann Gutenberg brought the West up to date with his invention of movable type. This was a system of separate characters for printing on a press with ink and paper.

In 1455 Gutenberg's Bible was printed on a modified wine press. By the beginning of the 16th century, most major cities in Europe had a printing press of their own. This is how and when printing got its start. So our first form of printing was what we call Letterpress.

WHAT IS OFFSET LITHOGRAPHY?

Actually offset lithography is a grandparent of stone lithography. Stone lithography was discovered in Europe by Alois Senefelder Near 1796. He discovered the principle that oil and water donot mix. Through his experimenting he found, if he wrote with a grease pencil on a stone, then wet it with water, he could apply ink to the greasy markings made by the grease pencil and the rest of the stone remained cleaned from the ink. This led him to wetting and re-inking the stone before each impression. He called this new process: "LITHOGRAPHY", which means; Stone Writing.

The first American printing press for lithography was operated by steam and was designed by R. Hoe of New York about 1868.

Our first OFFSET PRESS came about in 1906, and was invented in Nutley, New Jersey. It really was an invention through accident by Ira Rubel. An impression was mistakenly printed from a press cylinder on to a rubber blanket, which was the impression cylinder. The image transferred on to the sheet and this was the beginning of OFFSET PRINTING.

THE VITAL LINKS

PAPER

AND ITS HISTORY

Approximately 2,000 years ago the Chinese invented paper making. In 1200 A.D. the Spaniards were making paper, and 200 years later the process was established throughout Europe. In 1494 the English built the first paper mill, and in 1690 William Rittenhouse was the first American to manufacture paper.

Wood pulp is the basis of printing papers, only writing and ledger papers are made from rags to any great extent, they also contain a percentage of wood pulp.

THE BEGINNING OF PRINTING INKS

Believe it or not, printing inks waited for Gutenburg because China was using printing ink for block printing in the third century before Christ.

From the basic lampblack - glue water to linseed oil. Printing inks have advanced right along with modern methods. In fact printing inks have set the pace for printing with such inks as: Heat - Set, Precipitation, Wax - Set, Steam - Set, Water - Reducible, Electrostatic, and Fluorescent inks.

Few understand printing inks and their abilities, taking for granted that it gives color to the printed object on paper. Many resort to adding varnishes, and powders to inks without really knowing what they are doing or why.

Printing inks are manufactured for general purposes and for specific needs. If you know what you are doing in the first place The Ink You Purchase will be right.

2.) ELEMENTS OF LAY - OUT AND DESIGN:

A.) Design must contain:

a.) BALANCE - (Formal, Informal, or Radial).

b.) UNITY - units to form a whole. Subject matter to connect.

c.) VARIETY - connecting items to complement object.

d.) PROPORTION - relationship between all the parts of a unit.

e.) SCALE - proportion to other objects.

f.) RHYTHEM - repeating them, repetition of emphasis leading to focal climax.

g.) EMPHASIS - something you create in your design, something you design around.

B.) Know what press you are running job on.

a.) Know presses limitations.

b.) Know maximum sheet size.

c.) Know maximum printing size.

d.) Know gripper margins.

C.) DEMONSTRATE HOW TO MAKE 8 PAGE BOOKLET DUMMIE

a.) Explain work and turn.

D.) ELEMENTS OF COMPOSITION

a.) Legibility - Factors other than style and size of type must be considered. (I) The spacing between the lines is important. Rule of thumb: Allow more space between long lines than between short ones. (2) Proper space must be allowed between words and sentences to prevent them from appearing to run together. (3) Margins are also important, for they provide white space around the type form. Giving a unified appearance and help make a more attractive and easier to read sheet.

b.) The following should always be remembered:

1.) Style of letter.

2.) Size of letter.

3.) Length of the line.

4.) Space of leading between the lines.

5.) Space used in between words.

6.) Margins around the type form.

c.) Discuss various methods of compositon.

E.) ELEMENTS OF CAMERA

a.) Camera operation.

1.) Use of equipment.

2.) Explanation of materials.

b.) How to produce line copy.

c.) Reductions and enlargements.

d.) Halftone photography:

1.) Use of gray scale.

2.) Use of screens.

3.) Flash.

F.) PLATE MAKING:

1.) Masking and stripping of negative.

2.) Opaquing of negative.

3.) Stripping in of halftone with line copy.

a.) Plate processing:

1.) Developing.

2.) Lacquering.

3.) Preserving.

4.) Double burning.

G.) ELEMENTS OF OFFSET PRINTING:

1.) Water and oil reaction.

2.) Demonstrate flow of:

a.) Water

b.) Ink

3.) Demonstrate transfer:

a.) Ink to paper.

4.) Demonstrate:

a.) Water unit.

b.) Ink unit.

c.) Plate cylinder, (attaching plate).

d.) Blanket cylinder, (attaching blanket).

e.) Register board and side guides

f.) Caliper, (double sheet eliminator).

g.) Governor, (pile height).

h.) Feed tray.

i.) Foot sheet side guides.

j.) Delivery end.

5.) Mechanics of:

a.) Water unit and adjustment.

b.) Ink unit and flow adjustment.

c.) Blanket leaver and adjustment.

d.) Paper feeder.

e.) Vacuum pump.

f.) Raising and lowering of copy.

g.) Side to side movement of copy.

h.) Pressure adjustments.

6.) MAINTENCE:

a.) Water unit.

b.) Ink rollers.

c.) Blanket.

d.) Lubrication.

7.) MISCELLANEOUS:

a.) Problem solving.

b.) Ink mixing.

c.) Chemicals.

COMPOSITION

SUGGESTED TEST VOCABULARY

ALIGNMENT

BOLD FACE

COMPOSITION

DUMMY

FACE

FAMILY TYPE

FORMS

IMPRESSION

ITALIC

JUSTIFICATION

JUSTIFYER

LAYOUT

MARGIN

PICA

POINTS

PUNCTUATION

RIBBON

SANS SERIF

SERIF

SPACING

SUB - HEADING

TYPE FONT

COLD TYPE

HOT TYPE

PRESS TYPE

The above would be in the form of a multiple choice test.

CAMERA

SUGGESTED TEST VOCABULARY

BENDAY

BLOW UP

CAMERA

OPAQUE TAPE

COARSE SCREEN HALFTONE

COPY

DEVELOPER

DOUBLE BURN

DUOTONE

FILM

FIXING SOLUTION

GUM

HALFTONE SCREEN

LENS

LINE SHOT

MONTAGE

NEGATIVE

PASTE - UP

RETOUCHING

PLATE MAKING

SUGGESTED TEST VOCABULARY

PLATE GUM

LACQUERING

LIGHT TABLE

STRIPPING

OPAQUE

PRE - SENSITIZED PLATE

DIRECT IMAGE MASTER

FLAT

GOLDENROD

REIGSTER MARK

PLATE BURNER

ARC LIGHT

VACUUM FRAME

DOUBLE SIDED BURN

REPRO PEN

OFFSET PRINTING

SUGGESTED TEST VOCABULARY

BLANKET CYLINDER

BACKING UP

COPY

BLEED PAGE

PLATE CYLINDER

IMPRESSION CYLINDER

DAY - GLO

DAMPENING ROLLERS

DELIVERY

DUMMY

OFFSET LITHOGRAPHY

RELIEF PRINTING

INTAGLIO

SCREEN PROCESS

PROCESS PRINTING

FEEDER

PROOF

HICKEY

GHOASTING

BUILD UP

PLANOGRAPHY

FOUNTAIN

FORM ROLLER (INK)

SIDE GUIDE

VACUUM

CALIPER

BINDING

SUGGESTED TEST VOCABULARY

JOGGER

COLLATE

ANTIQUE FINISH

BINDING

BOND

BROCHURE

DECKLED EDGE

DRILLING

FELT SIDE

PADDING

PADDING KNIFE

SHEET COUNTER

POWER CUTTER

STAPLING

STITCHING

SADDLE STITCH

SIDE STITCH

SNAP SETS

CUT MARKS

WORK AND TURN

HEAD TO TOE

TRIM

LESSON - PLAN

INTRODUCTION TO THE OFFSET DUPLICATOR

OBJECTIVES:

1.) Mechanics of the water system.

2.) Workings of the inking unit.

3.) Cylinder relationships.

PLAN OF ORDER:

A.) The Press.

1.) Give the student study sheets.

2.) Brief introduction to the uses of the machine.

B.) Its Functions.

1.) Types of papers used in the machine.

2.) Show where adjustment is made.

3.) Have students fill in blanks on provided hand-outs.

4.) Names of the water unit rollers.

5.) How water unit rollers operate.

6.) Names of inking unit rollers.

7.) How inking unit rollers relate to each other.

8.) How the cylinders operate, and the names of each.

9.) The relationship of each cylinder to each other, and the water and ink unit.

This should give the student an understanding of the three major unites of a printing press; which also apply to larger equipment.

Understanding the WATER, INK, and CYLINDER relationship brings out the ever important factor: WATER & INK BALANCE.

This will result in the student knowing how to trouble shoot:

1.) Wash - out

2.) Build - up.

3.) Ink coverage.

4.) Lay of ink.

5.) Proper pressures.

WASH - OUT

NOTE LIGHTNESS

AND GREY COLOR

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Mdse BULLETIN No. 41

DATE: March 20, 1974

BULLETIN TO ALL TRIPLE-S REDEMPTION CENTER MANAGERS

REFERENCE: BIG BOY - Gas Barbecue, Item #46-288 x 17 Bks.
-- SPECIAL ORDER ITEM --

With the coming of the "BBQ'g." season - this is just a reminder that we have plenty of stock on the Big Boy Portable Barbecues, Item #46-288.

AS PICTURED BELOW - The Portable LP-Gas Barbecues, have heavy-gauge cold rolled steel bowls, stainless steel windbands, chrome-plated grills, round cast-iron burners, mounting brackets for two 14 Oz. propane tanks. (TANKS NOT INCLUDED) Graded pumice rock.
Gas Barbecuing Booklet Included

A GREAT ITEM FOR CAMPERS, PICNICERS, OR
BACK YARD CHEFS

P.S. - STEAKS ARE NOT INCLUDED

Phil Majorek
Buyer

PDM:la

WASH - OUT

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TONE - UP

NOTE BUILD-UP

OF INK

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BULLETIN TO ALL TRIPLE-S REDEMPTION C[illegible] M[illegible]

REFERENCE: BIG BOY - Gas Barbecue, Item #46-28[illegible]

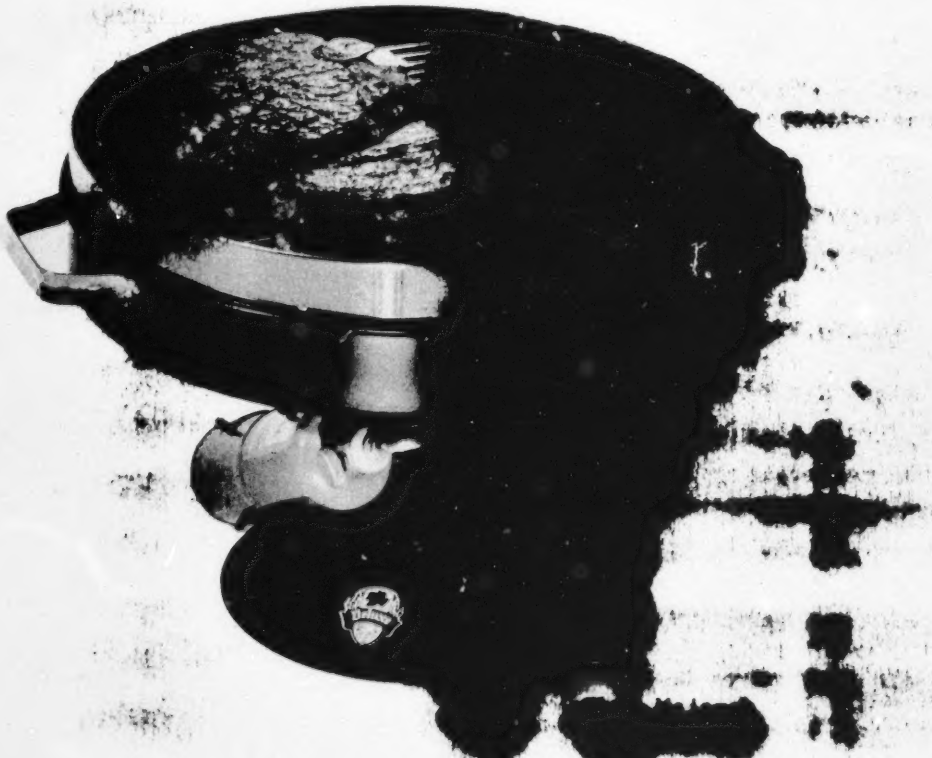
-- SPECIAL ORDER ITEM --

With the coming of the "BBQ's," [illegible] this is just a reminder that we have plenty [illegible] Barbecues, Item #46-288.

AS PICTURED BELOW - The Portable LP-Gas Barbecues, have heavy-gauge cold rol[illegible] stainless steel windbands, chrome-plated gr[illegible] iron burners, mounting brackets for two 14 [illegible] (TANKS NOT INCLUDED) Graded pumice rock. [illegible]arbecuing Booklet Incl[illegible]

A GREAT ITEM FOR CAMPERS, [illegible]CNICERS, O[illegible] BACK YARD CHE[illegible]

P.S. - STEAKS ARE [illegible] INCLUDED



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TONE - UP

QUALITY RUN SHEET
WITH PROPER WATER
AND INK BALANCE

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P.S. - STEAKS ARE NOT INCLUDED

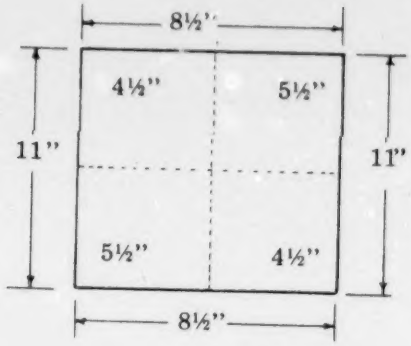
Phil Majorek
Buyer

PDM:la

JOB - SHEET

JOB: Produce a 4¼" X 5½", 8 page book'et.

Mock-up:



MATERIALS:	
Black ink	Dark Room chemicals
8½" X 11" Paper	Film
Fountain solution	Staples
Plate etch	Opaque
Blanket wash	Red Opaque Tape
Cotton pads	Masking Tape
Raggs	Plates

EQUIPMENT & TOOLS:	
1250 Multilith	Light table
Adjusting wrench	Camera
Screw driver	Developing trays
Allen screws	Paper cutter
Plyers	Stapler
Plate burner	Ink knife

General Instructions:

Prepare layout of type and pages. Set type and make a mechanical, which is to be approved by instructor. Strip negs and burn in plates after camera work is completed, before running on press get approval.

PROCEDURES:

Utilizing one 8½" X 11" sheet of 16# bond paper, run on both sides work and turn.

REFERENCES:

Lecture notes

Text book: Photo - Offset

Hand outs

ASSIGNMENT SHEET

SUBJECT: Introduction to the offset duplicator.

AIM: For the beginning student to be able to run the offset duplicator good enough to produce a printed job. The finished product would be a one color one sided using line copy without to much ink coverage. Finished product would have to be centered and free of ink build ups or water wash outs or dry ups.

INTRODUCTORY INFORMATION: Through the use of demonstrations and lectures the students will be introduced to the offset press in stages: The water unit and its workings. The inking unit and its relationship of the various ink rollers, along with their identification. The printing cylinders and their relationship, also identifying them.

REFERENCE: Each student will be given a printed sheet on the unites of the offset press described above. These sheets will have information left out, and the student will have to fill in the blanks as the lesson and demonstrations are given. These will serve as a reference.

PROBLEMS: Students will be given a job to run in order to see how well they understood lesson.

INSTRUCTOR'S GUIDE SHEET

SUBJECT: Introduction to the offset duplicator.

OBJECTIVES: Introduce the begining student to the machines: water system and parts, workings of the inking unit and roller identification, and the printing cylinder relationships.

PRESENTATION: Introduction on the use of the machine.

TEACHING OUTLINE	AIDS
Introduction to press	Demonstrate on machine
Functions of press	Demonstrate on machine
Explain water system	Give hand outs that students can fill in blanks.
Explain inking unit	Give hand outs that students can fill in blanks.
Introduce students to various types of paper.	Give samples of each.

APPLICATION: Break class into groups and have each group runn off an offset plate as an introduction.

MATERIALS: Already used paper on one side, ink, etch, blanket wash, fountain solution, cotton pads, rags.

ASSIGNMENT: Hand outs become study guides when filled in from demonstration and lesson.

JOB CHECK CHART

DESCRIPTION	LINE WORK	HALF TONE	TWO COLOR	DUO-TONE	THREE COLOR	FOUR COLOR	4 SIGNITURES	8 SIGNITURES	WORK & TURN
STRIP NEG.									
BURN PLATE									
SET WATER									
SET INK									
SET FEEDER									
SET CALIPER									
ADJ. BLOWERS									
SET SIDE GUIDE									
SET PUSH GUIDE									
ADJUST HIGHT									
ADJUST SIDES									
SET DELIVERY									
ADJUST VACUUM									
ADJUST BLOWERS									
SET COUNTER									

JOB ANALYSIS

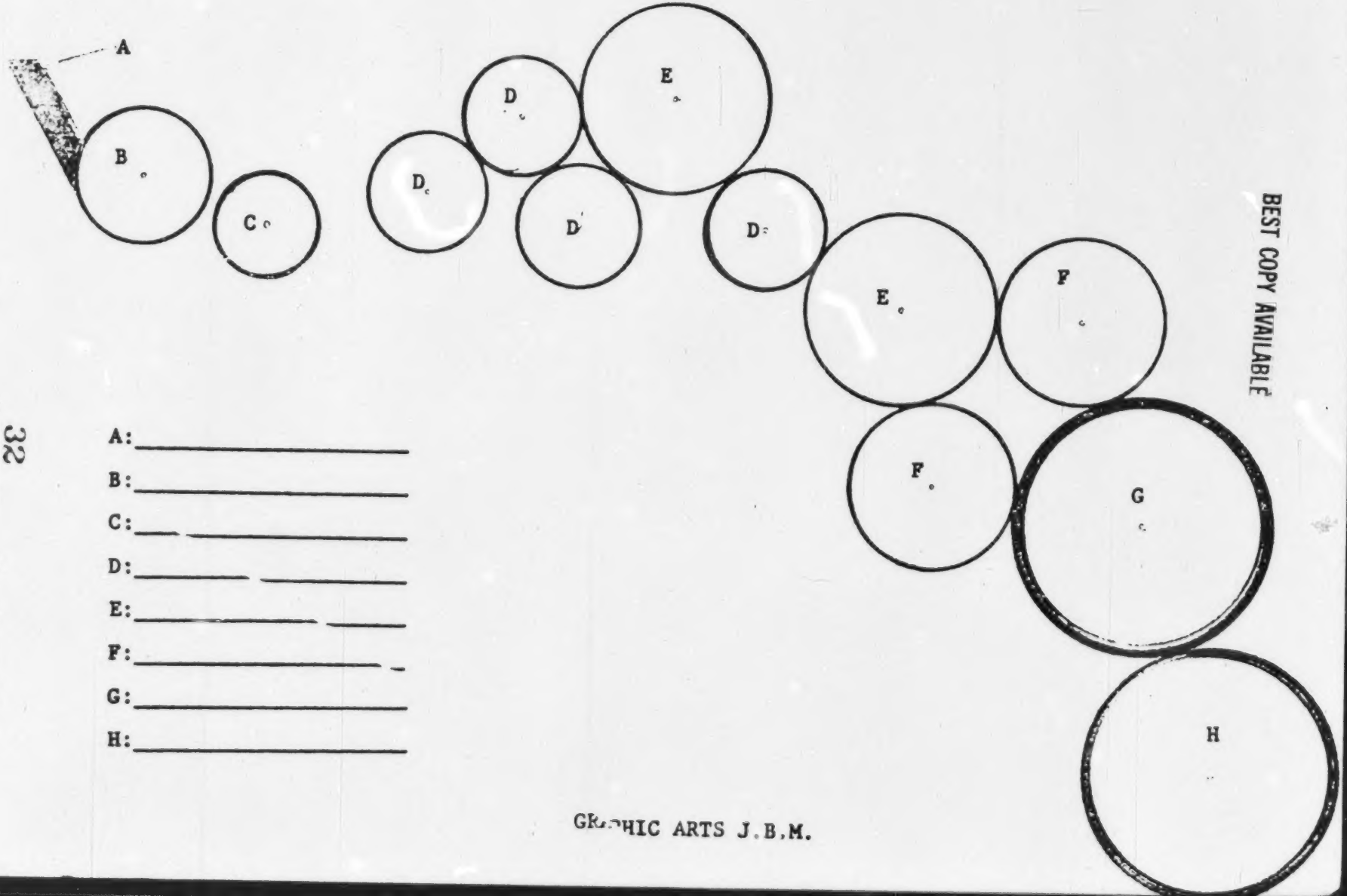
NAME OF JOB: To produce a 4½' X 5½', 8 page booklet.

DO (Operation)	KNOW
Prepare mechanical for job.	Know how to square up job for positioning. Set cold type. Allow for grippers. Know how signitures lay.
Photograph mechanical.	Use of dark room chemicals, camera, film, and screens.
Prepare Negative.	How to strip up film, aline for press and allow for plate bend.
Burn plate.	Adjust time, aline properly on plate, gum, laqurer and regum.
Run job.	Operation of press: Inking, water, cylinder relation, feeder adjustments, centering procedures, paper adjustments.
Binding of job.	How signitures fold, the types of stitching.
Finishing.	Triming which will include the proper use of the paper cutter following all safety rules.

HAND - OUTS

DIAGRAM OF THE PRINTING UNIT OF

THE I250 MULTI



A: _____

B: _____

C: _____

D: _____

E: _____

F: _____

G: _____

H: _____

GRAPHIC ARTS J.B.M.

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OFFSET PRINCIPLE

OF PRINTING.

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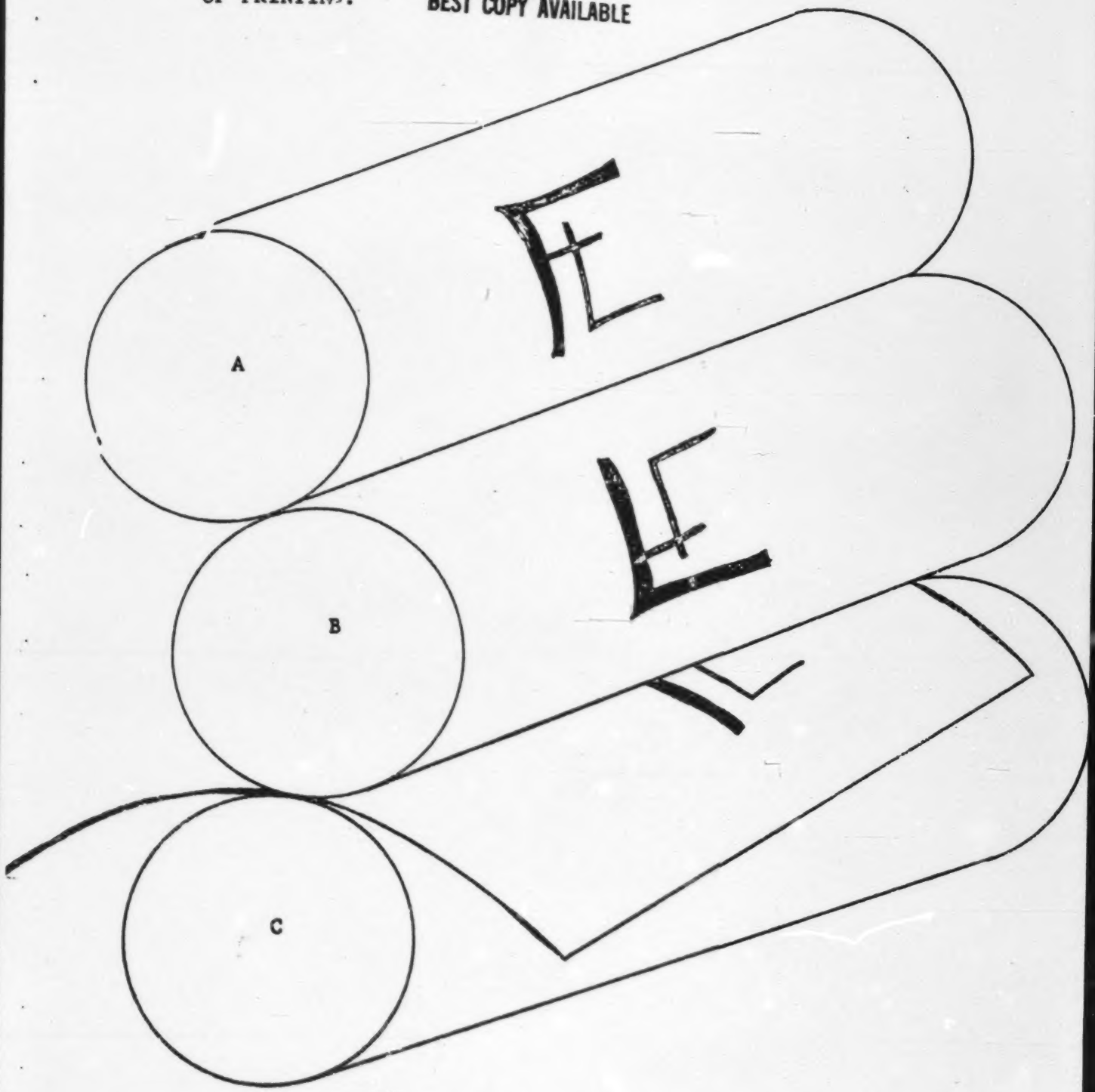

The three cylinders are;A_____, B_____,

C_____.

The principle of offsetis:_____

_____

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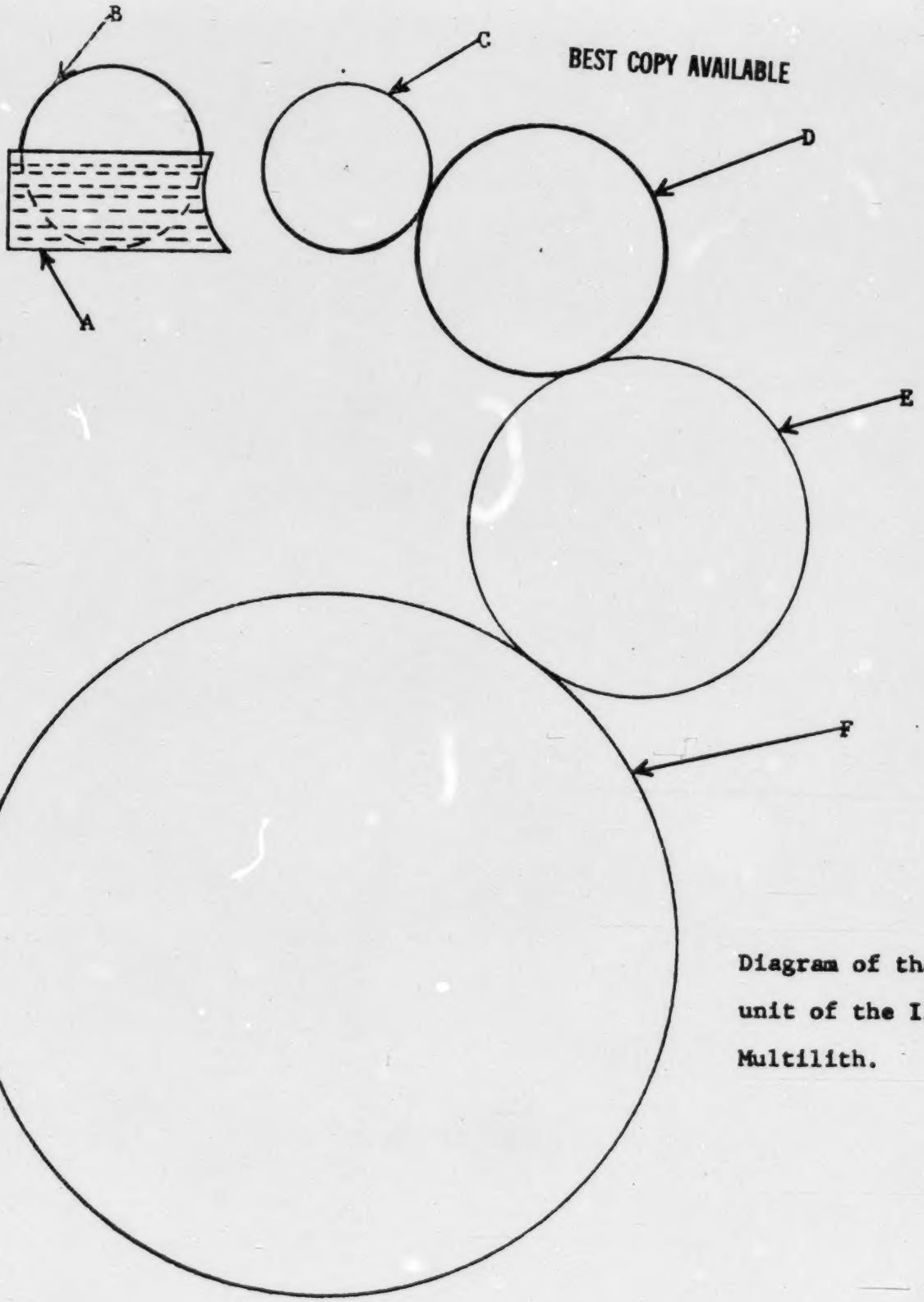

Diagram of the water unit of the I250 Multilith.

A: _____. B: _____. C: _____

D: _____. E: _____. F: _____

REFERENCES

THIS BOOKLET WOULD NOT HAVE BEEN POSSIBLE IF IT WERE NOT FOR THE COOPERATION OF THE FOLLOWING INDIVIDUALS, PUBLISHERS, AND CORPORATIONS:

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SAMPLES OF VARIOUS STOCKS THAT

ARE

COMMONLY USED IN THE

MULTILITH

1250